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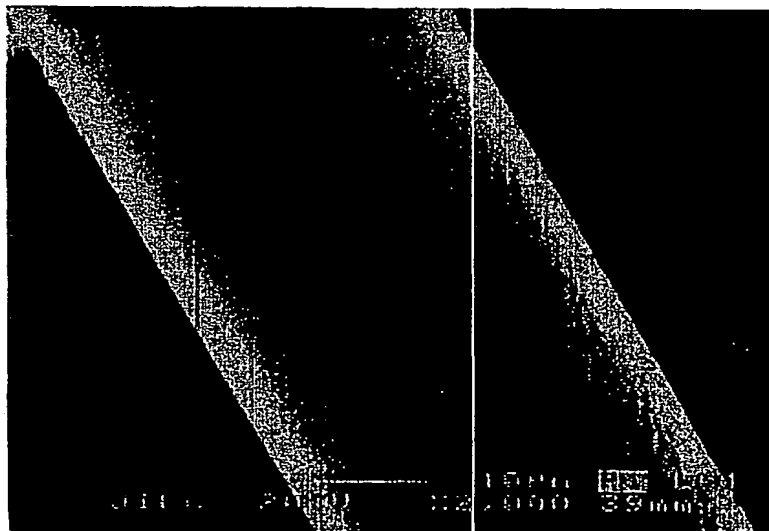
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(54) Title: NANOCOMPOSITE CERAMICS OF OXIDE AND NON-OXIDE PHASES AND METHODS FOR PRODUCING SAME



(57) Abstract: A composite of nanoscale oxide ceramic phases is dispersed in a non-oxide ceramic matrix material. The non-oxide ceramic phase may be silicon-carbon-nitrogen-based, and imparts resistance to mechanical degradation, resistance to chemical degradation, and resistance to oxidation at temperatures up to 1800°C. The nanodispersed oxide phase is selected according to desired functional properties, including coefficient of thermal expansion, rheology, ferromagnetic and superparamagnetic properties, superdielectric properties, and superpiezoelectric and electrostrictive properties. A method is provided for making a nanocomposite ceramic fiber having a nanodispersion of zirconia in a silicon-carbon-nitrogen ceramic phase. A method is provided for making a soft ferromagnetic ceramic having a nanodispersion of ferrite in a zirconia in a silicon-carbon-nitrogen ceramic phase.

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